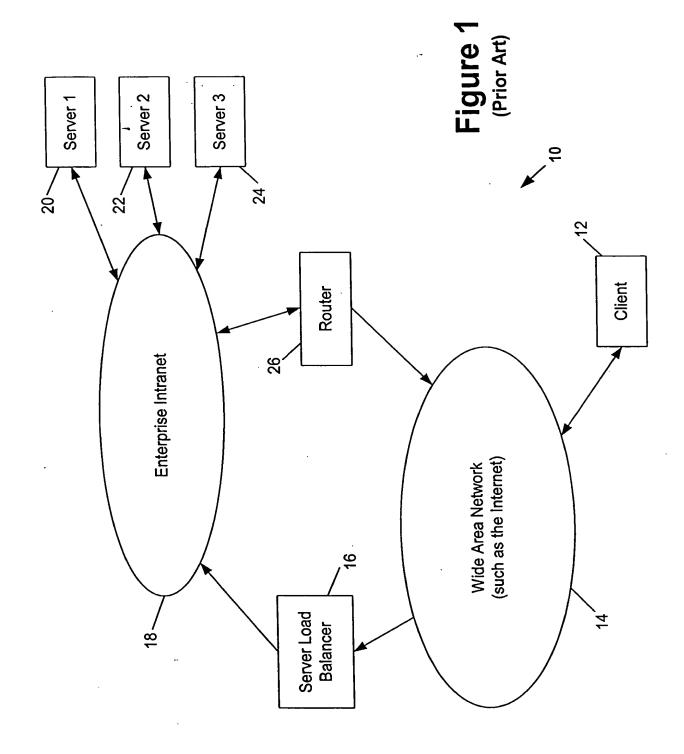Preallocation of Client Network Address
Translation Addresses for Client-Server
Networks
Inventors: O'Rourke, et al.
Attorney Docket No. 062891.0460
Filed: February 8, 2001
Sheet 1 of 7

Figure 1
(Prior Art)

Preallocation of Client Network Address
Translation Addresses for Client-Server
Networks
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Attorney Docket No. 062891.04
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202

Start

204

User Input
Parameters

206

Create the Client
NAT Pool

208

End

Figure 2

Preallocation of Client Network Address
Translation Addresses for Client-Server
Networks
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Attorney Docket No. 062891.0460
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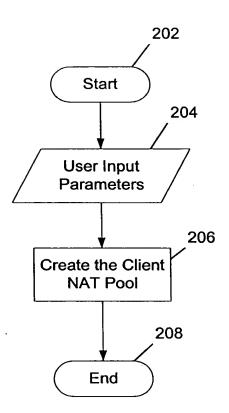| CNP	Field Symbol	Field Name	Source
304	PNAME	Pool Name	Input
306	FIPA	First IP Address	Input
308	LIPA	Last IP Address	Input
310	NETMASK	Net Mask	Input
312	ICONNS	Initial Num. Connection Blocks	Input
314	MCONNS	Max Num. Connection Blocks	Input
316	MPA	Memory Pool Address	NULL derived
318	ILA	Interval List Address	Derived

302

Figure 3

Preallocation of Client Network Address
Translation Addresses for Client-Server
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	407	412, 414, 416, 418, 420, 422, 424, 426
10.10.10.10:11002	10.10.10.10:11003	10.10.10.10:11004
10.10.10.10:11005	10.10.10.10:11006	10.10.10.10:11007
10.10.10.10:11008	10.10.10.10:11009	10.10.10.10:11010
10.10.10.10:11011	10.10.10.10:11012	10.10.10.10:11013
10.10.10.10:11014	10.10.10.10:11015	10.10.10.10:11016
10.10.10.10:11017	10.10.10.10:11018	10.10.10.10:11019
10.10.10.10:11020	10.10.10.10:11021	10.10.10.10:11022
10.10.10.10:11023	10.10.10.10:11024	10.10.10.10:11025

400

Pool Header — 404

Subpool Header — 406

Subpool Header — 408

Subpool Header — 410

Figure 4

Preallocation of Client Network Address
Translation Addresses for Client-Server
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Memory Pool User

501

Client NAT Address Range Management

503

Memory Management

505

Configure
Client NAT
Address Range

504

CNP

Allocate Client NAT
Address Range

506

CNP

CONN_POOL

Allocate Memory Pool

510

Memory Pool Create(
PNAME,
MCONNS,
INCR,
INIT_PROC,
DEL_PROC,
CONTEXT)

512

Store address of
connection pool
(CONN_POOL)

508

INIT_PROC(
SUB_POOL,
CNP)

516

ALLOC_INTERVAL(
CNP,
SUB_POOL,
NUM_BLOCKS)

518

Subpool Create

514

Initialize Blocks with
Client NAT Addresses

520

Return

522

Grow Pool
(No free blocks)

528

527

Figure 5

Allocate
Connection Block

524

CONN_POOL

CONN_BLOCK

526

ALLOC_BLOCK(
MEM_POOL)

Preallocation of Client Network Address
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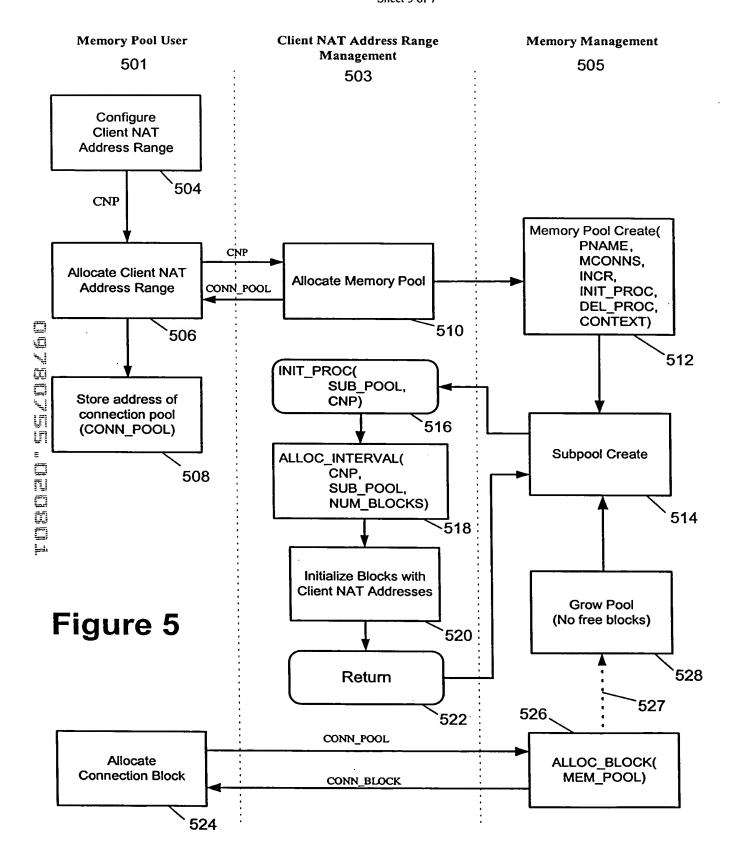Attorney Docket No. 062891.0460
Filed: February 8, 2001
Sheet 6 of 7

Memory Pool User

501

Client NAT Address Range Management

503

Memory Management

505

Deallocate Connection

— CONN_BLOCK →

Chain Block to Free List

604

606

DEL_PROC(SUB_POOL, CNP)

612

Shrink Pool (All Blocks Free)

608

DEALLOC_INTERVAL(CNP, SUB_POOL, NUM_BLOCKS)

614

Free Subpool
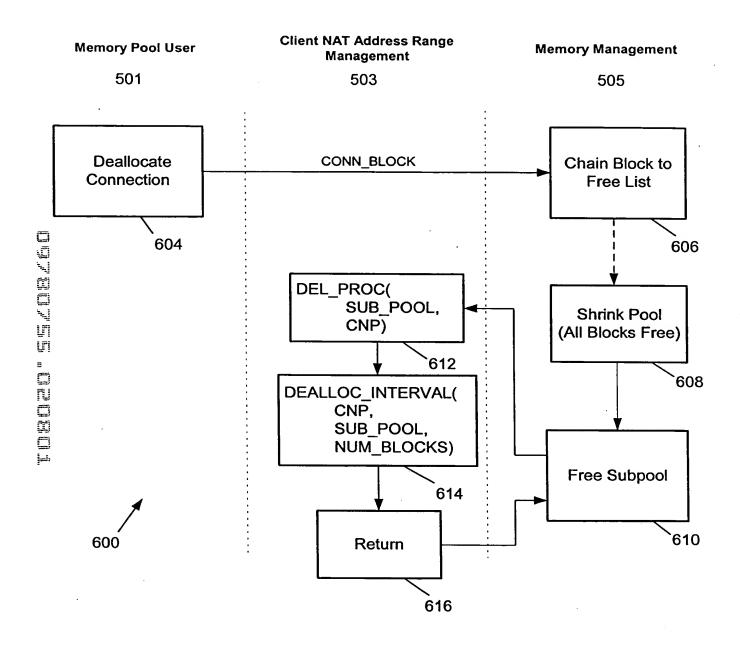
610

Return

616

600

Figure 6

Preallocation of Client Network Address
Translation Addresses for Client-Server
Networks
Inventors: O'Rourke, et al.
Attorney Docket No. 062891.0460
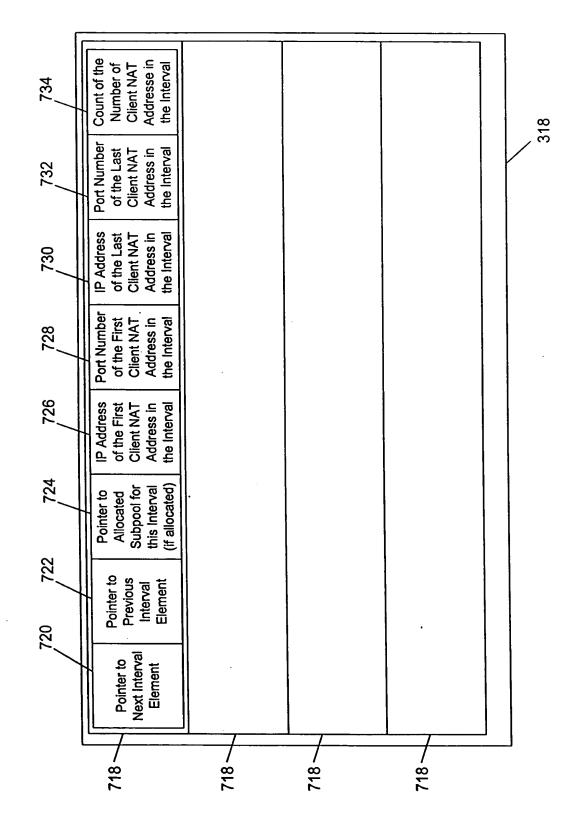Filed: February 8, 2001
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720 Pointer to Next Interval Element	722 Pointer to Previous Interval Element	724 Pointer to Allocated Subpool for this Interval (if allocated)	726 IP Address of the First Client NAT Address in the Interval	728 Port Number of the First Client NAT Address in the Interval	730 IP Address of the Last Client NAT Address in the Interval	732 Port Number of the Last Client NAT Address in the Interval	734 Count of the Number of Client NAT Addresse in the Interval
718							
718							
718							
718							

318

Figure 7